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SKMC Class of 2022: SI/ME Abstract

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A Comparison of Homemade Phantoms for Ultrasound Guided Peripheral Intravenous Catheter Insertion

Saami Zakaria, Liam Hughes, Lauren Selame, Kelly Kehm, Resa Lewiss, Arthur Au, Zachary Risler***

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Purpose: U/S guided peripheral intravenous catheter (PIV) placement is implemented in many clinical settings. Commercially available U/S phantoms are expensive and difficult to alter from stock. Non-commercial phantoms have been described in published literature without data showing which type is more efficacious. The primary objective of this study was to determine efficacy of various non-commercial phantoms for U/S guided PIV placement, while secondary objectives were to characterize the cost and ease of production.

Methods: This prospective observational study trialed six unique phantom models: 1) Amini ballistics gel model, 2) Morrow ballistics gel model, 3) University of California San Diego (UCSD) gelatin model, 4) Rippey chicken model, 5) Nolting spam model, 6) and Johnson tofu model. The total cost, ease of material acquisition, and time for creation were noted as selected phantoms were assembled through instructions from the source reference. Six U/S fellowship

trained Emergency Medicine physicians performed U/S guided PIV placement on each model to evaluate their effectiveness. All questions were answered via Likert-scale (1-5).

Results and Conclusions: The Rippey model consistently outperformed other models in this study (aggregate Likert scale 4.8), doing so with a mid-level cost and minimal preparation time. Cost of production ranged from \$4.39 (Johnson model) to \$29.76 (UCSD). Creation times ranged from 10 minutes (Johnson) to 120 minutes (UCSD). Non-commercial U/S phantoms may represent cost-effective and useful PIV insertion practice tools. Future studies should investigate the utility of these phantoms in teaching USIV to novice learners and direct comparison of non-commercial to commercial phantoms.